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GEOGRAPHICAL FACTORS IN THE DEVELOPMENT OF SOUTH AFRICA

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The geographical factors here to be considered as affecting the development of South Africa are: Its position with respect to other parts of the world and its distance from them; its dimensions, boundaries and climates, and a few of the larger features of its topography.

The position of South Africa in the southern hemisphere of the earth is such that the sun passes high across the sky from right to left, instead of from left to right, as with us in the northern hemisphere; and this is I believe the earliest reported general peculiarity of that far country; for old Herodotus recorded two thousand years ago that, as he was told, a party sent out from Egypt sailed south along the east coast of Africa, until, after turning west for a time, they sailed north along the west coast and entering between the pillars of Hercules returned home through the Mediterranean; he adds, the explorers said that while they were farthest south, the sun crossed the sky from right to left; a story which the faithful old historian said he put down as it was told him, though he did not believe it.

Now if sun dials had been first invented in that southern region and had there set the fashion for marking the hours on our clock faces and watch dials in the northern hemisphere, nine would have been on the right and three on the left; but such is not the case. On the contrary, all the southern hemisphere clocks and watches are numbered in northern hemisphere fashion, counting around from left to right, with three and nine "where they belong."

Again: our midshipmen are taught that the winds of cyclonic storms whirl against the sun in the northern hemisphere, but with it in the southern hemisphere. As a mat-

ter of fact, inasmuch as the sun's diurnal motion and the whirling winds of cyclonic storms both depart in the southern hemisphere from their habit of turning in the northern hemisphere, the winds of southern hemisphere storms really turn against the sun's motion in the southern hemisphere, just as is the case with the two motions in the northern hemisphere. But a little thing like the movement of the sun in a remote hemisphere is not enough to disturb a northern seaman's empirical rule; and it is therefore still the fashion to teach our midshipmen that the winds of southern storms turn with the sun, although a few days' observation of the facts in the southern hemisphere will suffice to show the midshipmen that such is not the case. Indeed the meaning of the seaman's phrase "with the sun" is not learned by looking at the sun in the sky, but by blindly remembering that it means from left to right; and the phrase has this meaning all over the world.

Both of these trifling matters as to the numbering of clock faces and the seaman's empirical rule, illustrate a large principle: The several land areas of the southern hemisphere, of which South Africa is one, are so comparatively small and so far separated, that they have not developed a civilization of their own, and therefore in nearly all civilized matters they submit to the dictation of the northern hemisphere. This is not a matter of chance; it is an evident consequence of the unsymmetrical distribution of the continents with respect to the equator.

The position of South Africa with respect to lands and waters is one of remoteness and isolation. On three sides, east, south and west, it faces broad oceans, nowhere less than two thousand miles across, and very little interrupted by islands. The force of the waves, as they break on the rocky coast of the Table Mountain range by Cape-town, brings vividly to mind the vast uninterrupted stretch of waters on which the westerly winds of the South Atlantic sweep. Not only is South Africa far from its southern neighbors, but the Africander would gain little by traversing any one of the three southern oceans; he would find an uninhabitable polar land to the south; and on the east and west

he would reach only two remote offshoots from the centers of civilization. The three southern habitable lands are indeed so far separated from one another that all eyes in any one of them turn for a sight of the greater things of life, not to each other, but to the northern hemisphere, in spite of its still greater distance. The fact that the nearest of the northern lands to South Africa is India, a densely populated country, has an important bearing on the peopling of the east African coast, as will be further indicated below, in connection with the monsoon winds.

How striking is the contrast of this remoteness and isolation of Cape Colony with the neighborliness of the other end of Africa; for while the southern extremity of the continent has for a nearest neighbor the barren Antarctic regions, lying beyond a broad and boisterous, icy sea, North Africa faces across a comparatively narrow and truly temperate sea, well named the Mediterranean, interrupted by many islands, toward the most favored lands of the world. Pity, that so well placed a land should be in so large measure a desert! Striking, that the desert on the south has for ages been a greater barrier than the sea on the north; for beyond the desert the single continent is inhabited by another race of men, while the borders of the two continents around the sea are inhabited chiefly by a single race.

On the fourth or northern side of South Africa lies an imperfectly known wilderness, occupied chiefly by savages, even though lately partitioned off among civilized European nations. The subjugation of this wilderness offers great problems for the future; but up to the present time, the vast extent of unknown or little known land northward from the southern colonies has been a hindrance to travel, a barrier against Europe. All communication has been by vessels on the sea surface, and by cables on the sea bottom; the overland railway is a thing of the future, perhaps not much sooner to be realized than the more open route through the air.

The effects of the element of distance by which South Africa is separated from the rest of the world deserve careful analysis. Distance is of course to be measured from

some starting point; and what point is more appropriate for our present purposes than that region from which the dominating influences of civilization have spread over the earth; namely, west central Europe; that extraordinary part of the world, already mentioned as the most favored division of the lands, in which the enlightened peoples of the world have been developed and from which they have gone out to all other lands in most cases to dominate them; while the peoples of other lands, now widely distributed in many parts of the world besides their original home, have never gained footing in Europe; only the Laps in the far north and the undesirable Turks in the southeast calling for exception from this extraordinary rule.

From west central Europe then, South Africa is distant some five thousand or six thousand miles, and this distance must be measured over water, for, even though the shortest line or great circle course passes largely over land, the overland line is today a much longer route of travel, measured in time, than the somewhat roundabout course over the sea, by either the east coast or the west coast route. Some day, and probably not very far in the future, as history measures time, the Cape-to-Cairo railway will be completed. Whatever difficulties and delays continental transportation with its several trans-shipments will there encounter, it will have one great advantage with respect to intercourse; that is, there will be stations all along the line, promoting continuity of relations, instead of blank stretches of water, which establish discontinuity and thus aid distance in emphasizing isolation.

As to this commonplace element of distance, we are apt to treat it somewhat disrespectfully in these modern days; and to urge that it is practically annihilated with respect to diplomatic affairs, to the larger events of the world's news, and to the more important business transactions, by the use of land wires and submarine cables. True it is, that the address delivered by Sir George Darwin at the opening of the great bridge over the gorge of the Zambesi River just below the Victoria Falls in 1905 was printed in the London papers that same evening: and the newspaper cor-

respondent who accompanied the party fairly enough bragged about this as remarkable achievement. We also know that transportation is now so easy, so quick, and so cheap that the people and the products of the most distant lands are interchangeable quantities; that newspapers, magazines and books go everywhere and tend to unify language and thought, and that post-office facilities, with the use of the Roman alphabet and of Arabic numerals, are making a large part of the world's population acquainted with each other and bringing them into common ways of doing many things.

All this is true; but to say that distance is annihilated is like saying that the Great American Desert, as a name applied to our southwestern arid region, is to use a popular phrase, "wiped off the map"; certainly the words, Great American Desert do appear less frequently on our maps now than formerly; but the desert is there; and all the extension of the reclamation service cannot transform more than small parts of it into irrigated oases, or "settlements," as we call them. There is a vast, permanently dry region in our southwestern States, persistently held under nature's climatical control, in spite of every artful modern improvement by means of which so many small areas in the desert are developed to their utmost.

So it is with the element of distance in regard to South Africa. So far as communication and transportation are concerned, it is the time element, closely associated with distance, that is reduced; practically to no time in case of telegraphing, and to only three or four weeks in case of travel and traffic. But the actual distance does not shrink: and it is to the deeper, slow-growing consequences of this irremovable element that I wish to ask especial attention. For though the influence of distance is not immediately apparent, it acts unceasingly, like gravity and climate; and when combined with the other factors that produce discontinuity, it in time must affect many of the deeper concerns of life. We must remember that distance is one of the chief factors of isolation, and that isolation in the organic world has been of fundamental importance in giving opportunity

for the development of different species. Distance undoubtedly lies at the bottom of the various causes which have resulted in the development of different races of mankind, and, along with differences of race, differences also in language, in religion, and in many ways of looking at and thinking about things. Distance acts to break old tradition; witness the sociological innovations of Australia and New Zealand, in contrast with the conservatism of Great Britain. Witness again the fact that in none of the many colonies settled from Europe, where aristocracy is so deep rooted, has a titled nobility found permanent place. Distance seems in recent centuries to have exercised a selective influence on a middle group of modern population, between what may be called a higher group, which, having abundant means and satisfied ambitions, prefers to stay at home, and a lower group, which has to stay at home because it has neither means nor ambition to go away—abstraction being made of the melancholy class of deported criminals and vagrants, whose redemption was formerly shirked by the home country. The middle group has had the ambition to better its middling state, and the means to make a try at its ambition; thus the middle group has been the colonizing group, which moved away from the home population to fill the distant ends of the earth.

When the distant colony is reached, the most enterprising and aggressive new-comers press to the frontier; gentleness, considerateness, forbearance in their dealings with others, especially with inferiors, are less common with the invaders than the contrasted qualities of roughness, dominance and intolerance. The hasty acts of the isolated frontiersman are seldom restrained by a tempered public sentiment in favor of patience and conciliation, for at the outpost of civilization there is no public to have a sentiment. Thus again but in a smaller way, distance acts in the distant colony to sift its population.

Distance, moreover, aids the colonist in his new surroundings, with his new needs and new opportunities, to develop his own new way of doing old things; for it decreases the amount of interference he will suffer from the old country,

and thus gives his new surroundings fuller opportunity of producing their due effect. Not that new habits are produced directly by distance, but that they are the responses to the new kinds of climate and soil and products which are found in the distant colony. If the same new conditions of climate and soil were provided next door to England, on a land area closely and broadly welded to the mother country, instead of on a land area remotely isolated from it, their influence would be far less profound, because abundant intercourse would then be maintained between the two areas; and active intercourse between two regions tends to prevent the elements of local environment in a new region from having their full effect in producing local departures from the old habits that had previously been developed in the other region.

South Africa is not only far away from Europe, but, from its relative position, it is out of the way of travel to most other distant places; hence it is all the more isolated from the rest of the world. Before the adoption of the Mediterranean-Red Sea route between Europe and the Orient, South Africa was to some degree in the way; just as Nantucket and Martha's Vineyard were, in the days when there was choice of conveyance between sailing packet and stage coach, to some degree in the way between Boston and New York. But no one stops nowadays at those islands on the way between our two cities; and so dominant is the centralizing influence of Europe that hardly anyone stops at South Africa nowadays, on the way to some other place; unless it may be an Antarctic explorer on his way out or home: and South Africa is not yet large or important enough to have much traffic of its own in the way of steamship lines radiating to Australia, India, and America.

I wish it were possible to present all the consequences of the geographic factor of distance, but that is a greater task than I can undertake. Indeed the little I have already said savors almost as much of deductive expectation as of induced generalization. But I am persuaded that distance is a factor of large value and that its working will repay close observational study on the ground. The difficulty in such

a study is that the action of distance, in giving comparative freedom from old influences and thus in favoring the action of new influences is difficult to identify, but careful search and close scrutiny may discover signs of it, and even only well grounded suppositions as to its effects would, to my understanding of the problems here involved, be a welcome change from the older habit of taking things for granted without inquiry, or of ascribing things to the "inborn spirit of the people" without analysis of their natural causes. We must constantly remember in this connection that all the Romance languages have branched from the parent Latin stock and gained their individual qualities largely under the long-continued influence of distance, as a means of preventing mixture; and while, for the future, the art of printing and the wide spread of systematic education will greatly lessen the rate of language change, change will surely go on to some extent; indeed it is actually going on! The Boers who of all the South African colonists, have been longest separated from their parent country, no longer speak pure Dutch. The addition of Dutch and of native words is already causing South African English to depart from the mother-tongue, in spite of all the Afrikaner's affection for the old country which he, southern born, nevertheless calls home.

But it is in the natives of the southern half of Africa that we have the best illustration of the enormous value of the distance factor, provided that it has had time in which to work. With oceans on three sides and a broad desert on the fourth, central and southern Africa, far from other lands, have come to be the home of a race of mankind unlike other races, as they are unlike it. Whatever may be the intimate causes of racial differences, distance and time have given the opportunity for their development. Time is a historical, distance a geographical factor; and I therefore suggest to this audience, in which, it is to be hoped, both geographers and historians are present, the problem of determining by the inductive comparison of many examples how great a distance, how complete an isolation, and how long a time are necessary in order to develop racial and national char-

acteristics. Perhaps we must ask the aid of archeologists and geologists in solving such a problem. For one I should be greatly interested in its solution; we could then much better than now give appreciative attention to the degrees to which existing nations and races are differentiated. We might be able to do still more; we might be able to make a beginning at least in the discovery of the more delicate causes which, under the opportunity afforded by distance, isolation and time, have produced the actual differences which characterize different peoples. As a step towards such discovery, nothing can be more helpful than historico-geographical conferences, of the kind in which we are here taking part; but many such must be held before we shall have made great progress.

In the meantime, it would be well if all who have to do with South Africa, either in the way of settlement, trade, missions or administration, would remember that long inbred racial characteristics always include peculiar ideas and ideals, and that it is immensely difficult for a lower race to give up its own standards and accept the standards that are brought to it by a higher race from far oversea. A trained understanding of anthropological problems, supported by a sympathetic interest in the well-being of native races, would go far in reducing the dissensions and in preventing the quarrels that usually characterize the advance of a civilized race into the land of an uncivilized race.

Climate is a geographical factor much more generally recognized than distance, and the climatic factors of South Africa are well marked. The southern part of South Africa, the region to which I am here giving most attention, belongs in the so-called south temperate zone; a name, like latitude and longitude, imposed on the world at large from the little Mediterranean region of classic times, but doubly a misfit in the southern hemisphere, first because it implies that the south temperate zone is a duplicate of the north temperate, with only such changes as are seen in the left hand passage of the sun, and in the displacement of the seasons from the months to which we of the northern hemisphere habitually assign them; while as a matter of fact the south temperate

zone is on the whole an oceanic zone, and hence strongly unlike the north temperate zone, which is a land and water zone, with a larger proportion of land than is included in any other climatic belt. As a result, the climate of the south temperate zone is inclement rather than temperate:—witness the untempered climate of far South America and the neighboring islands in latitudes no higher than those which in Europe permit an abundant population. As far as southernmost Africa is concerned, its climate around the coast is fairly temperate; yet as soon as the interior is reached, there are strong diurnal and seasonal ranges of temperature that, like those of northern interior lands, are anything but temperate in the proper meaning of the word.

The southern coastal border of Cape Colony has an interesting climatic peculiarity in the way of winter rainfall and summer droughts, because it lies under the southern meteorological tropic—not the geographical but the meteorological tropic; that is, under the ill-defined band of high atmospheric pressure which separates the trade winds from the stormy westerlies. This band shifts with the sun, and so determines wet and dry seasons. I wish it were politely permissible to give some account of the cause of this shifting, for it is a fine example of the elaborate interaction of various forces, in which now one component, now its opposite gains a slight ascendancy; and as a result the band separating the two wind belts oscillates in an annual period over some four or five degrees of latitude; but the presentation of this problem involves the introduction of technical terms having a physical or mechanical flavor, such as poleward temperature gradients, isobaric lines, centrifugal force, and so on; terms, the understanding of which demands that one shall have traveled along a somewhat scientific and disciplinary path before an enjoyable prospect is attained; a path moreover that is not, as is the case with the equally difficult and disciplinary path that leads to a really enjoyable understanding of the Classics, associated with polite learning and literature; hence, beautiful and admirable as the delicate relation of the forces involved in the oscillation of the wind system is, it remains outside of the polite circle of cultured intercourse,

admission to which is reserved chiefly for thoughts gracefully phrased and easily understood. But the results that follow from the oscillation of the wind belts is plain enough. The summer of Cape Colony, December to February, is dry; the winter, June to August, provides most of the moderate rainfall: hence in this respect the Colony is like southern Australia and a middle part of Chile in the southern hemisphere, and like the Mediterranean countries and southern California in the northern hemisphere; all of these districts being climatically known as subtropical.

The annual distribution of rainfall in subtropical countries is not simply an unrelated scientific fact; it is a climatic factor which determines that irrigation is needed as an aid to agriculture in the growing season. Hence the early Dutch settlers had before them a problem, the very reverse of that drainage problem which had so long troubled their ancestors at home, where the Rhine and the sea threaten their best lands with overwhelming floods. Irrigation would have been much more important in South Africa if the rivers there were perennially fed from lofty mountains; but unhappily the mountains of the South African subtropical belt are not high enough to provoke much rainfall; the rivers run with seriously decreased volume in summer time; and irrigation, as thus far developed, is of moderate importance. Nevertheless, the lowlands and the valleys near the coast contain many pleasant villages with a thrifty agricultural population. A striking feature of Cape Colony is the scarcity of native trees. Botanical evolution has there been a failure in this respect, though remarkably successful in developing a peculiar vegetation. Curiously enough, trees from other continents find the climate of southernmost Africa congenial; pines from the Mediterranean lands, and eucalyptus and mimosas from Australia are now abundant.

If we now consider the variation of climate with latitude, we may pass a short distance northward from Cape Colony into an inner region, to which the winter rains do not extend from the south nor the summer rains from the north; hence we find there an arid region, the Karroo, not absolutely bare of vegetation, but truly barren in being extremely

unproductive of the kinds of plants that man likes to cultivate. There is some scanty herbage for sheep and goats, yet hardly enough for profitable cattle raising; but ostrich farming may come to be a characteristic of the Karroo, although it is destined long or always to remain thinly populated. The villages at the railroad stations in the Karroo are in so desolate a landscape as to make the traveler wonder what the villagers subsist upon.

Still farther north in the interior plateau region is the treeless Veldt, a highland of dry and mild winters followed by hot summers in which an irregular rainfall comes in heavy showers, sometimes in drenching floods. This is the great pastoral region; here the Boers came in their "Treks," and became great landlords; but here are gold and diamonds also, with the resultant crowded mining populations, and there is said to be much copper farther inland: hence inner South Africa has altogether different problems to deal with from those of agriculture alone. Farther north, the summer rains increase in amount, until they merge with those of the equatorial belt in its southern migration; and with increase of rainfall comes the forested country along the Zambesi, with scattered and gnarled trees at first, as if they had a hard time to survive seasons of drought, but farther on with more abundant growth; and thus South Africa passes into Central Africa.

We habitually think of climate as varying chiefly with latitude. If there is any part of the world of which that style of variation is characteristic, it is the great south temperate zone, where the mean annual isothermal lines so nearly coincide with the parallels of latitude, especially on the oceans. But wherever the southern continents extend into the south temperate oceanic belt, there are climatic variations of great significance along the parallels of latitude, east and west.

In South Africa the winds come more from the east than from the west. Hence the east coast of South Africa is climatically much better favored than the west coast. The slopes and lowlands of Natal and Mozambique, where the descent is made from the interior highlands to the Indian

ocean, have abundant rainfall and much forested land; while German Southwest Africa, where the highlands fall off more gradually to the Atlantic, is for the most part a desert, even to the seashore. For the same reason, the interior areas now called Orange River Colony and the Transvaal were chosen by their European settlers on the east of the continental axis, towards the rainy coastal slope where they get more rainfall, while the dry western half of the interior, including the Kalahari desert, was avoided.

The monsoon winds of the Indian ocean deserve mention here, for they have had a strong effect on the distribution of population. The monsoons between India and equatorial Africa blow alternately in opposite directions, from the northeast for about five months while the sun is south of the equator, and from the southwest for five other months; while the sun is north; and this has from time immemorial promoted interchange between two continents. As a result, the stronger of the two races, the Indians, have invaded the east coast of Africa and extended southward as far as Natal; and through all this stretch they and not the African natives are the small traders. There has been no such foreign immigration on the west coast where monsoons are wanting and South America is far away.

The northern border of South Africa, here limited climatically in the neighborhood of the 18th degree of south latitude, does not follow the irregular political boundaries of English, German and Portuguese dominions, except for the line between German "Southwest" and Portuguese Angola. The area thus delimited measures over a thousand miles north and south; and over thirteen hundred miles across the northern side. Its coast is singularly simple. It has very few islands: of the few that it formerly had, one is now attached to the mainland by a belt of wave-swept sands, and forms the peninsula of Table Mountain range, at the northern end of which Cape Town has a moderately good harbor. Nearly all the other islands are hardly more than rock ledges. The coast has few bays; the largest are on the east coast, and to each of these a railroad descends from the highlands, one from Rhodesia, and the other from the Transvaal,

both in competition with the line farther south from Orange River Colony to Durban, an exposed port on the nearly unbroken coast of Natal. Hence to remoteness and isolation, we may now add compactness of outline, such that the natives were never led to become a seafaring people, by reason of islands tempting trials at navigation; and such that seafarers from elsewhere found few good harbors in bayheads, where they might land on their way into the interior.

The origin of the simple coast line of South Africa is an interesting problem regarding which further investigation is needed, but the facts already acquired indicate that the existing extremity of the continent is only the remaining part of a formerly more extensive continental area, large parts of which have been bent or broken down and submerged, while the surviving land area has been broadly uplifted to its present plateau-like altitude. The evidence in favor of this view is particularly striking along the southeastern coast, where the large-pattern arrangement of the geological structure is obliquely truncated by the shoreline, in such a way as immediately to suggest the loss of a bordering fragment of unknown but of significant size. The east-west mountain ranges of southernmost Africa lead to a similar conclusion when they are followed to their eastern ends; one range after the other is there cut off by the shoreline, without any sign of a termination in the folded structures which determine the well defined mountain alignment. Deep water is soon reached in the Indian ocean eastward from these obliquely truncated structures, thus suggesting the deep depression and submergence of a former continental area; a suggestion that should be borne in mind, in all discussions of the so-called "permanence of continents."

The most significant characteristic of the relief of South Africa is its topographic simplicity over a vast interior area; and this seems to be a matter of anthropogeographic importance as tending to develop political unity. Around the coasts, there is a certain measure of diversity, but the interior plateau is characterized by comparative uniformity over vast distances.

The east-west ranges of Cape Colony, just mentioned, are serious but not formidable barriers against penetration inland: fortunately they are cut through by a number of deep water gaps, which serve as gateways from the coast settlements to the interior. The inner members of the east-west valleys back of the larger ranges are so dry that they are and must remain thinly inhabited, and hence are not likely to become politically independent of the better favored and less sparsely settled coastal lowlands. Along the eastern side, the plentifully peopled coastal lowlands, are backed by a rapidly rising country, too rugged to permit close settlement, and of value only as it is related to the coast. Along the western side, the climate is arid and much of the coast is desert, even in immediate proximity to the ocean. Here Germany is, diplomatically speaking, a leading factor; but it seems impossible that even so enterprising a people as the Germans can ever, notwithstanding the pressure for expansion at home, come to be numerically important in this forlorn colonial possession.

The interior of South Africa is essentially indivisible for civilized occupation. It is an extended plateau, somewhat diversified by isolated hills and mountains which rise singly and in groups, but which nowhere extend in sufficient height and length to form a chain of such importance as to determine a natural political boundary; the mountains are nowhere continuous enough to suggest the division of the interior into permanently separated states. Here again, distance more than any other element has determined such political divisions as have been defined. Cape Colony is not limited to the southern belt of east and west ranges and valleys, but extends into the interior beyond Kimberly as far as its influence can reach. The Transvaal is merely beyond the Vaal River from the Orange River Colony; Rhodesia is simply the farther interior, too far for the earlier Boers to occupy; and hence left over for later development by farseeing and dominating British invaders.

Various minor political divisions, such as Griqualand West—if it still remains on the map—can be regarded as only provisionally set off from the larger possessions; for

the small political units of the interior have no such individuality as will long maintain their separate existence. Moreover all the interior colonies are absolutely dependent on the coastal lands for their opportunity of intercourse and commerce with the rest of the world; there may be a northward overland outlet constructed, but it will involve transshipment on lakes, and hence its tolls will be so heavy that the more roundabout oversea transportation lines will underbid it. So long as the interior was peopled only by scattered Boers on cattle ranges, who were content to be let alone, their political independence was conceivable; but when extensive mining operations were undertaken, and when vast capitalistic enterprises were planned for the development of the farther interior, none of the interior populations could be let alone. They must all grow together. Nevertheless, there are certain factors which determine diversity of population and of interests, and which must therefore be managed with skill in order to bring about the political unity that seems to be so manifestly the destiny of South Africa. The first of these factors is racial diversity: Europeans, East Indians, and Africans, with the latter in great majority especially in the interior. The second factor is industrial diversity, with the present extremes in cattle farming and mining, one a primitive occupation, involving little skilled labor, and a sparse scattered population composed of landlords and serfs; the other a highly elaborated occupation, involving much skilled labor, expensive mechanical equipment, and a densely compacted population at a few centers. The further consideration of the problems thus suggested leads too far from my theme for further consideration here, but they will be actively discussed in the next half century by all who are interested to watch the progress of a dominant civilized minority in relation to a subordinate uncivilized majority. Let us hope that the minority may act so justly as never to tempt the majority to violent revolution.